Mathematical Methods – MA142

2025 NHT Assessment Guide

VCAA Marking Policies and Procedures

Consistency of Marking

The Assessment Guide indicates the basis for awarding marks for each item. This may involve either counting correct answers/features of a response or marking holistically, whereby making a judgement about the overall quality/qualities of a response.

The Assessment Guide will demonstrate how marks are to be awarded for a response, not where or how marks are to be deducted. The Assessment Guide will address specific examples and relevant application where appropriate. The following table provides a list of common concerns that all assessors should follow for consistent approaches to marking VCE external examinations.

Assessors should contact the Chief Assessor in cases where they believe that by following any of the directions below, a student will not be marked fairly.

Assessors must use the final version of the Assessment Guide as confirmed at the end of the Assessor Training Meeting.

|  |  |
| --- | --- |
| Concern | Advice |
| **Responses ‘off task’ or contradictory** | A response that does not address the subject of the question cannot be awarded any marks.  If contradictory responses are given (i.e.: the response conflicts with earlier comments or working out) full marks cannot be awarded. |
| **Responses not addressed in the Assessment Guide** | Assessors should refer the matter to the Chief Assessor for determination. |
| **Spelling** | Unless otherwise instructed in the Assessment Guide (i.e.: as part of a criteria), incorrect spelling should not affect the scoring of a student’s response. |
| **Specified Number of Examples/Reasons** | Where a student provides more than the required number, the assessor should only assess the required number of responses, and these should be assessed in the order in which they appear. |
| **Working Out** | Where a question explicitly requires the student to show working out, and this is specified in the examination instructions or in the question, full marks should be awarded if:   * The response is correct and the working out is correct * Two sets of working out are shown, both attempts are correct, and the answer is correct   Where a question explicitly requires the student to show working out, partial marks should be awarded for correct completion of key steps required to produce the correct answer. |
| **Consequential Errors** | If a question requires a series of argued/sequential steps to arrive at the correct response, the Assessment Guide will allocate marks for the key steps required to produce the correct response.  In these cases, the effect of a consequential error on a subsequent response will be considered. |
| **Half Marks** | Half marks must not be awarded for a response or carried over to subsequent questions. |
| **Crossing Out** | If a student response has been crossed out, the part crossed out should not be considered. If the entire response is crossed out, this is awarded zero (‘0’). |
| **Modules** | Where a student responds to more modules than required, the assessor must assess all responses. |
| **Options** | Where a student responds to more than one option, the assessor must assess all responses according to the Assessment Guide and award the student the highest score, indicating the option selected. |
| **Not Attempted vs Zero (0)** | Where a student has **not made a genuine attempt** to respond to the question, assessors should score the response as ‘Not Attempted’. This may include:   * Blank responses * ‘I don’t know’ * Repeating the question, task, source material, or any other text directly from the examination * A response with no relevance to the task.   Where a student **has made a genuine attempt** to respond to the question, assessors should score the response as ‘0’ (zero) where:   * The student has crossed out their whole response or * The student’s response does not meet the assessment criteria to be awarded any marks. |

Student Concern

Occasionally, assessors encounter a response that may raise concerns about the welfare of the student. Examples may include:

* suggestions or claims of abuse or neglect
* indications of distress or self-harm
* threats of violence, harm, or criminal acts involving others.

In such cases, assessors should assess the student work in accordance with the Assessment Guide and send the student script/item to be reviewed according to the instruction on the next page.

**Any matter of concern that an assessor believes requires urgent attention should be referred to the VCAA immediately via call to the VCAA Helpdesk on 1800 820 122 or email to** [**vcaa.assessment.operations@education.vic.gov.au**](mailto:vcaa.assessment.operations@education.vic.gov.au)**.**

Sending student responses to review

During marking assessors may identify student responses to be escalated for review by the Chief Assessor or to be noted by VCAA staff. The review categories are:

|  |  |
| --- | --- |
| Category | Description |
| **Illegible response** | You are unable to read the student’s response. |
| **Incomplete student work** | The student appears to be missing part of their response or has indicated it continues in another area that is not attached as an attachment. |
| Possible connection to student | You recognise the student’s work. Please provide details. |
| Student concern | There is evidence of student distress. |
| Technical Issue (VOSS Helpdesk) | You are not able to continue scoring this exam or item due to a technical issue. Only use this category if you have contacted VOSS support on 1800 820 122. |

Below is a list of common issues that may arise, and how to respond to these:

|  |  |
| --- | --- |
| Issue | Action |
| Evidence of student distress or concern.  Note:  Unfinished work or work that is off-task is not considered a ‘student concern’. | Assess the student response using the Assessment Guide.  Send the student response for review, selecting the ‘student concern’ review category. |
| The student’s handwriting is too faint to read, and you are unable to read and score the student response accurately.  **Note:** Some student responses may include different handwriting or typed responses. This is usually due to Special Examination Arrangements and therefore does not need to be reported to the VCAA. | Make every effort to read the student’s work. If unable to read the response, send the script for review, selecting the ‘illegible response’ review category. |
| The student’s response appears to be unfinished, or they have indicated their response continues on another page that is not attached. | Refer to the Assessment Guide and score this as the student’s response, and send the student response for review, selecting ‘incomplete student work’ review category. |
| The control of the mechanics of language is not sufficient to communicate a coherent response. | Refer to the Assessment Guide and score this as the student’s response. You may contact the Chief Assessor for advice on how best to score the response. |
| Responses in Languages other than English | Unless otherwise stated, responses in a language other than English should not be awarded marks and should be scored zero (0). |

| Q# | Marks | Solutions | Mark allocation and notes |
| --- | --- | --- | --- |
| 1a | 2 | **Or using product rule** | 1M – quotient rule or product rule, must have 2 terms separated by +/-, one involving log,  1A – must cancel powers, not  ok |
| 1b | 2 |  | 1M – use of chain rule, must see  1A – not  ok, must come from correct derivative |
| 2 | 3 | from -intercept      Sub (1) into (2) | 1A—correct *c*  1M – set up any two linear equations in terms of *a* and *b* and attempt to solve   * Or two correct values of correct from an alternative method.   1A |
| 3a | 2 | reference angle  **,**  , | 1M – solve f(x)=0 to get  tan(x)=+/- 1 and see +/-  , as ref angle  1A – must define ’’, other forms |
| 3b i | 2 |  | 1M -set up f(x)=g(x) and express tan as sin/cos equality  1A all 3 (only) |
| 3b ii | 3 |  | 1A – tangent shape and orientation (strictly increasing) extend over domain (one period) and tend towards asymptotes (not multiple flicks)  1A – asymptotes correct and labelled as equations  1A – all 3 intersections labelled and correctly positioned |
| 4a | 2 |  | 1M – a single binomial term with  and exponent sum to 4, need to see  1A –equivalent answers |
| 4b | 3 |  | 1M –set up sum of 2 terms involving and exponents sum to 10  1M – a binomial sum of 2 terms with  and attempt to combine, see on denominator(s) and  as common term in numerator(s)  1A |
| 5a | 2 |  | 1M – set up a quadratic equal to zero and attempt to solve (substitution not necessary)  1A – one answer only, no explanation needed |
| 5b | 2 | **Or alternatively**    **Or alternatively** | 1M – set the correct derivatives equal to one another and attempt to solve  1A – any valid form  1M – set the correct derivatives equal to one another and attempt to solve  1A – any valid form  1M – set the correct derivatives equal to one another and attempt to solve  1A – any valid form |
| 6ai | 1 | |  |  |  |  | | --- | --- | --- | --- | |  |  |  |  | |  | 0.6 | 0.2 | 0.2 |   Best seen by constructing a tree diagram | 1A |
| 6aii | 1 |  | 1A-accept , or just 1.6  1C – Accept of their table (only if probabilities sum to 1) |
| 6b | 2 | |  |  | | --- | --- | |  |  |     **Or alternatively--** | 1M –set up sum of two terms equal to 0.7, involve at least a 0.5 (or equal to 0.2, line 3 Pr(C))  or draw a tree diagram (or part of) with probabilities labelled, first branch correct, second branch involve at least a 0.5  1A—(x= , Pr(C)= ok)  1M-set up product of 2 terms equal to 0.3,  1A—(x= ok) |
| 7a | 2 | **Method 1:** Using quadratic formula, solutions at    **Method 2**: using completing the square.    **Method 3**, using roots- | 1M – use of quadratic formula to get 2 *x*-values or get  1A  1M – use of CTS to get 2 *x*-values or get  1A  1M set up equations and solve to get 2 sets of factors  (or give one correct value of b with some correct working 1 out of 2)  1A |
| 7bi | 1 | Alternatively, draw a diagram and explain  is many-to-one over , therefore does not exist  For example | 1M – must conclude both **and** explain many to one/not one to one  If using graphical approach, graph must show TP location (4th quad) **and** explain many to one/not one to one |
| 7bii | 2 | **Method 1:** Completing the square  For inverse let        **Method 2**: using quadratic formula      **Method 3:** using transformations | 1M – swap *x* and *y* and valid attempt to arrange to get *y* =  1A – watch for correct arm, must state, domain not needed, (but if stated needs to be correct)  1M swap *x* and *y* and valid attempt to get *y=*  1A-any form, correct arm and  1M – identify correct translations for  1A -any form, watch correct arm and |
| 7c | 2 | Alternatively  By inspection, if , then    Hence .  Alternatively--  Note that the difference between  the two roots of  is 4    Difference between roots: | 1M – identify quadratic inequality  or (equivalent) restricted domain of quadratic and therefore  , use of graph OK.  1A  1M – identify quadratic inequality  or restricted domain of quadratic and therefore  , use of graph OK.  1A  1M – identify quadratic inequality  or restricted domain of quadratic and therefore  , use of graph OK.  1A |
| 8ai | 1 | Using product rule    Or | 1M – ‘show that’, must see evidence of product rule in full (line 2 or 3 OK)  Or  1M—see evidence of the 2 product term derivatives. |
| 8aii | 3 | **Method 1**: “Hence” approach – integration by recognition      **Method 2:** “Otherwise” approach – *u* substitution    **Method 3: “otherwise” approach** splitting the numerator | 1M – attempt to use integration by recognition (either indefinite or definite form)  need to see the integrand of  or see  ( or with *k*)  1M –correct antiderivative  **and** attempt to substitute endpoints  1A – any equivalent surd or fractional index form.  1M—attempt to use *u* sub to get , or  ~~correct endpoints~~  1M—correct antiderivative and attempt to substitute correct *u* values (or if converted back to *x, x*-values)  Need to see  or  1A any equivalent surd or fractional index form.  1M—splitting the numerator and getting the integrand    1M—getting the correct antiderivative and attempt to substitute correct endpoints  1A- any equivalent surd or fractional index form. |
| 8b | 2 | From part ai | 1M- correct antiderivative and attempted to substitute in correct endpoints.  1A – must be in this form from correct working,  accept. |